

THAT WHICH IS CLAIMED:

1. A papermaker's fabric, comprising top machine direction yarns, top cross machine direction yarns, bottom machine direction yarns, bottom cross machine direction yarns, and sets of first and second stitching yarns, said fabric being formed in a plurality of repeating units, each of said repeating units comprising:

5 a set of top machine direction yarns;
a set of top cross machine direction yarns interwoven with said set of top machine direction yarns;
a set of bottom machine direction yarns;
a set of bottom cross machine direction yarns interwoven with said set of bottom machine direction yarns;

10 ~~wherein a pair of first and second stitching yarns is positioned between each adjacent pair of top cross machine direction yarns, said first and second stitching~~
~~yarns of each pair being interwoven with said top and bottom machine direction yarns such that, as a fiber support portion of said first stitching yarn is interweaving with said top machine direction yarns, a binding portion of said second stitching yarn is positioned below said top machine direction yarns, and such that as a fiber support portion of said second stitching yarn is interweaving with said top machine direction yarns, a binding portion of said first stitching yarn is positioned below said top machine direction yarns, and such that said first and second stitching yarns cross each other as they pass below a transitional top machine direction yarn, and such that each of said binding portions of said first and second stitching yarns passes below at least one of said bottom machine direction yarns.~~

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2. The papermaker's fabric defined in Claim 1, wherein each of said top cross machine direction yarns passes over a first group of alternate top machine direction yarns and under a second group of alternate top machine direction yarns, with each of said yarns of said first group being positioned between a pair of yarns of said second group, and with each of said yarns of said second group being positioned between a pair of yarns of said first group, and wherein said fiber support portions of

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said first and second stitching yarns pass under said first set of alternate top machine direction yarns and over said second set of alternate top machine direction yarns, such that said top machine direction yarns, said top cross machine direction yarns, and said fiber support portions of said first and second stitching yarns form a plain weave pattern.

Art 1
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3. The papermaker's fabric defined in Claim 2, wherein said fiber support portions of said first stitching yarns pass over a first number of said machine direction yarns, said fiber support portions of said second stitching yarns pass over a second number of said machine direction yarns, and said first number differs from said second number.

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4. The papermaker's fabric defined in Claim 2, wherein said fiber support portions of said first stitching yarns pass over a first number of said machine direction yarns, said fiber support portions of said second stitching yarns pass over a second number of said machine direction yarns, and said first number is the same as said second number.

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The papermaker's fabric defined in Claim 3, wherein said first number is larger than said second number, and wherein said second stitching yarn has a higher modulus of elasticity than said first stitching yarn.

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The papermaker's fabric defined in Claim 3, wherein said first number is three, and second number is two.

Art 7
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7. The papermaker's fabric defined in Claim 1, wherein said first and second stitching yarns are of a smaller diameter than said top machine direction yarns.

8. The papermaker's fabric defined in Claim 1, wherein each of said binding portions of said first and second stitching yarns passes beneath only one of said bottom machine direction yarns.

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9. The papermaker's fabric defined in Claim 1, wherein said repeat unit includes 10 top machine direction yarns and 10 bottom machine direction yarns.

10. The papermaker's fabric defined in ~~Claim 1~~, wherein said repeat unit includes 12 top machine direction yarns and 12 ~~bottom~~ machine direction yarns.

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11. The papermaker's fabric defined in Claim 1, wherein said top machine direction yarns and said top cross machine direction yarns are interwoven in a repeating pattern such that each of said top cross machine direction yarns passes over a first pair of adjacent top machine direction yarns, under a third top machine direction yarn adjacent to said first pair, and over a second pair of top machine direction yarns positioned adjacent said third top machine direction yarn, and wherein adjacent top cross machine direction yarns pass over top machine direction yarn pairs that are offset by two top machine direction yarns,

10 and wherein said stitching yarns are interwoven with said top machine direction yarns in a repeating pattern such that said fiber support portion of each of said first and second stitching yarns passes over a third pair of adjacent top machine direction yarns, under an adjacent top machine direction yarn, and over a fourth pair of adjacent machine direction yarns, then passes under said transitional top machine direction yarn, said third and fourth pairs of top machine direction yarns being offset from said first and second pairs by one machine direction yarn, such that said top machine direction yarns, said cross machine direction yarns, and said fiber support portions of said first and second stitching yarns form a 1x2 twill pattern.

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12. The papermaker's fabric defined in Claim 1, wherein said stitching yarns are interwoven with said top and bottom machine direction yarns such that adjacent pairs of stitching yarns cross beneath transitional top machine direction yarns that are offset by two top machine direction yarns.

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13. ⁹ The papermaker's fabric defined in ~~Claim 12~~, wherein between 25 and 50 percent of said first and second stitching yarns are interwoven with said top machine direction yarns as reversed picks.

14. A papermaker's fabric, comprising top machine direction yarns, top cross machine direction yarns, bottom machine direction yarns, bottom cross machine direction yarns, and sets of first and second stitching yarns, said fabric being formed in a plurality of repeating units, each of said repeating units comprising:

5 a set of top machine direction yarns;

 a set of top cross machine direction yarns interwoven with said set of top machine direction yarns;

 a set of bottom machine direction yarns;

10 a set of bottom cross machine direction yarns interwoven with said set of bottom machine direction yarns;

 wherein pairs of first and second stitching yarns are positioned between pairs of top cross machine direction yarns, said first and second stitching yarns of each pair being interwoven with said top and bottom machine direction yarns such that, as a fiber support portion of said first stitching yarn is interweaving with said top machine 15 direction yarns, a binding portion of said second stitching yarn is positioned below said top machine direction yarns, and such that as a fiber support portion of said second stitching yarn is interweaving with said top machine direction yarns, a binding portion of said first stitching yarn is positioned below said top machine direction yarns, and such that said first and second stitching yarns cross each other as they pass 20 below a transitional top machine direction yarn, and such that each of said binding portions of said first and second stitching yarns passes below at least one of said bottom machine direction yarns, and wherein between 25 and 50 percent of adjacent pairs of first and second stitching yarns are interwoven as reversed picks.

15. The papermaker's fabric defined in Claim 14, wherein each of said top cross machine direction yarns passes over a first group of alternate top machine direction yarns and under a second group of alternate top machine direction yarns, with each of said yarns of said first group being positioned between a pair of yarns of said second group, and with each of said yarns of said second group being positioned between a pair of yarns of said first group, and wherein a pair of first and second stitching yarns is positioned between each pair of top cross machine direction yarns,

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and wherein said fiber support portions of said first and second stitching yarns pass under said first set of alternate top machine direction yarns and over said second set of alternate top machine direction yarns, such that said top machine direction yarns, said top cross machine direction yarns, and said fiber support portions of said first and second stitching yarns form a plain weave pattern.

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Part 14

16. The papermaker's fabric defined in Claim 15, wherein said fiber support portions of said first stitching yarns pass over a first number of said machine direction yarns, said fiber support portions of said second stitching yarns pass over a second number of said machine direction yarns, and said first number differs from said second number.

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17. The papermaker's fabric defined in Claim 15, wherein said fiber support portions of said first stitching yarns pass over a first number of said machine direction yarns, said fiber support portions of said second stitching yarns pass over a second number of said machine direction yarns, and said first number is the same as said second number.

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18. // The papermaker's fabric defined in Claim 16, wherein said first number is larger than said second number, and wherein said second stitching yarn has a higher modulus of elasticity than said first stitching yarn.

19. ¹⁰ The papermaker's fabric defined in Claim 16, wherein said first number is three, and second number is two.

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20. The papermaker's fabric defined in Claim 14, wherein each of said binding portions of said first and second stitching yarns passes beneath only one of said bottom machine direction yarns.

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21. The papermaker's fabric defined in Claim 14, wherein said repeat unit includes 10 top machine direction yarns and 10 bottom machine direction yarns.

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22. The papermaker's fabric defined in Claim 14, wherein said repeat unit includes 12 top machine direction yarns and 12 bottom machine direction yarns.

Sub B27 (a) 23. A method of making paper, said method comprising the steps of: providing a papermaker's fabric comprising top machine direction yarns, top cross machine direction yarns, bottom machine direction yarns, bottom cross machine direction yarns, and sets of first and second stitching yarns, said fabric being formed in a plurality of repeating units, each of said repeating units comprising: a set of top machine direction yarns; a set of top cross machine direction yarns interwoven with said set of top machine direction yarns; a set of bottom machine direction yarns; a set of bottom cross machine direction yarns interwoven with said set of bottom machine direction yarns; wherein a pair of first and second stitching yarns is positioned between each adjacent pair of top cross machine direction yarns, said first and second stitching yarns of each pair being interwoven with said top and bottom machine direction yarns such that, as a fiber support portion of said first stitching yarn is interweaving with said top machine direction yarns, a binding portion of said second stitching yarn is positioned below said top machine direction yarns, and such that as a fiber support portion of said second stitching yarn is interweaving with said top machine direction yarns, a binding portion of said first stitching yarn is positioned below said top machine direction yarns, and such that said first and second stitching yarns cross each other as they pass below a transitional top machine direction yarn, and such that each of said binding portions of said first and second stitching yarns passes below at least one of said bottom machine direction yarns;

(b) applying paper stock to said papermaker's fabric; and
(c) removing moisture from said paper stock.

24. The method defined in Claim 23, wherein each of said top cross machine direction yarns passes over a first group of alternate top machine direction yarns and under a second group of alternate top machine direction yarns, with each of

5 said yarns of said first group being positioned between a pair of yarns of said second group, and with each of said yarns of said second group being positioned between a pair of yarns of said first group, and wherein said fiber support portions of said first and second stitching yarns pass under said first set of alternate top machine direction yarns and over said second set of alternate top machine direction yarns, such that said 10 top machine direction yarns, said top cross machine direction yarns, and said fiber support portions of said first and second stitching yarns form a plain weave pattern.

25. The papermaker's fabric defined in Claim 23, wherein said top machine direction yarns and said top cross machine direction yarns are interwoven in a repeating pattern such that each of said top cross machine direction yarns passes over a first pair of adjacent top machine direction yarns, under a third top machine direction yarn adjacent to said first pair, and over a second pair of top machine direction yarns positioned adjacent said third top machine direction yarn, and wherein adjacent top cross machine direction yarns pass over top machine direction yarn pairs that are offset by two top machine direction yarns,

10 and wherein said stitching yarns are interwoven with said top machine direction yarns in a repeating pattern such that said fiber support portion of each of said first and second stitching yarns passes over a third pair of adjacent top machine direction yarns, under an adjacent top machine direction yarn, and over a fourth pair of adjacent machine direction yarns, then passes under said transitional top machine direction yarn, said third and fourth pairs of top machine direction yarns being offset 15 from said first and second pairs by one machine direction yarn, such that said top machine direction yarns, said cross machine direction yarns, and said fiber support portions of said first and second stitching yarns form a 1x2 twill pattern.

26. A method of making paper, said method comprising the steps of:
(a) providing a papermaker's fabric comprising top machine direction yarns, top cross machine direction yarns, bottom machine direction yarns, bottom cross machine direction yarns, and sets of first and second stitching yarns, said fabric being formed in a plurality of repeating units, each of said repeating units comprising:
a set of top machine direction yarns;

a set of top cross machine direction yarns interwoven with said set of top machine direction yarns;

a set of bottom machine direction yarns;

10 a set of bottom cross machine direction yarns interwoven with said set of bottom machine direction yarns;

15 wherein pairs of first and second stitching yarns are positioned between pairs of top cross-machine direction yarns, said first and second stitching yarns of each pair being interwoven with said top and bottom machine direction yarns such that, as a fiber support portion of said first stitching yarn is interweaving with said top machine direction yarns, a binding portion of said second stitching yarn is positioned below said top machine direction yarns, and such that as a fiber support portion of said second stitching yarn is interweaving with said top machine direction yarns, a binding portion of said first stitching yarn is positioned below said top machine direction yarns, and such that said first and second stitching yarns cross each other as they pass below a transitional top machine direction yarn, and such that each of said binding portions of said first and second stitching yarns passes below at least one of said bottom machine direction yarns, and wherein between 25 and 50 percent of adjacent pairs of first and second stitching yarns are interwoven as reversed picks;

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25 (b) applying paper stock to said papermaker's fabric; and

(c) removing moisture from said paper stock.

27. The method defined in Claim 26, wherein each of said top cross machine direction yarns passes over a first group of alternate top machine direction yarns and under a second group of alternate top machine direction yarns, with each of said yarns of said first group being positioned between a pair of yarns of said second group, and with each of said yarns of said second group being positioned between a pair of yarns of said first group, and wherein a pair of first and second stitching yarns is positioned between each pair of top cross machine direction yarns, and wherein said fiber support portions of said first and second stitching yarns pass under said first set of alternate top machine direction yarns and over said second set of alternate top machine direction yarns, such that said top machine direction yarns, said top cross

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machine direction yarns, and said fiber support portions of said first and second stitching yarns form a plain weave pattern.